

# The Potential Impacts of Climate Change on Transportation

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**DOT Center for Climate Change and  
Environmental Forecasting**

# Research Workshop

## October 1-2, 2002







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- **Purpose:** *To gain input and perspectives on priority research topics related to the potential impacts of climate variability and change on transportation – through dialogue with transportation professionals, regional and national stakeholders, and experts in climate change and assessment*
- **64 participants**
  - DOT, EPA, USGCRP, CCSPO, USGS, NOAA, FEMA, NASA, DOE lab
  - Researchers in climate change, weather, transportation
  - State DOT, MPOs, non-profits, industry reps

# Framework:

## Regional and Modal Analysis

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	<b>COASTAL</b>	<b>INTERIOR</b>	<b>GREAT LAKES &amp; RIVERS</b>
<b>Marine</b>			
<b>Rail and Road</b>			
<b>Aviation</b>			
<b>Transportation Systems Perspectives</b>			

# Coastal Areas – Marine

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- Priority #1, Storms / Sea Level Rise
- Priority #2: Sedimentation / erosion
- Priority #3a: Decision-making / policy tools
- Priority #3b: Socio-economic patterns, legal issues
- Priority #4: Arctic shipping
- Priority #5: Changes in prevailing winds, waves, currents, precipitation
- Who:
  - NOAA, NASA, ACOE, Navy, USGS, DOT, DOE labs, EPA, ports, academia, National Dredging Team (Corps, EPA, others), States, metropolitan planning, land use agencies

# Coastal Areas: Rail and Road

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- Priority #1: Weather-related travel time delays
- Priority #2: Smart growth
- Priority #3: Lack of public awareness of the consequences of climate change
- Priority #4: Impact of climate change on roads and ecosystems

# Interior - Rail, Road and Pipeline

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- Priority #1: Lack of tools to support local/regional scale impact prediction and decision-making
- Priority #2: Hydrologic impacts on road, rail and pipeline infrastructure
- Priority #3: Extreme events and impacts on roads, rails and pipelines
- Priority #4: Spatial and temporal shifts in demand
- Who
  - railroads and State agencies, NOAA, NASA , NCAR, USGS, USEPA, ACOE, USDA, Soil and Water Conservation Service, FHWA, Federal research labs
  - Universities, AASHTO, State agencies, TRB, Railroads, Commerce, Pipeline companies, Chamber of Commerce

# Great Lakes and Waterways

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- Priority #1: Analysis of the climate events to come that impact the waterway system (Great Lakes and Ohio, Mississippi Rivers)
- Priority #2: Analysis of responses to events, and preparation of government management of impacts
- Priority #3: Understand competing interests for water relating to freight viability after climate changes long term
- Who:
  - NOAA, DOE, NASA, EPA, USGS, DOT, ACOE, DOD, DOC, Fish and Wildlife Service, State DOTs, PIANC, interstate water commissions, users, industry, academia, NGOs

# Aviation

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- Priority #1: Better understanding of high altitude emissions and climate chemistry
- Priority #2: Improved predictability of weather phenomenon (i.e. timing, confidence, location, frequency)
- Priority #3: Engine Technology
- Priority #4: Integrated framework to incorporate climate and other factors into tradeoffs between emissions and noise
- Priority #5: How to tie R&D on environment to safety and efficiency
- Who:
  - FAA, industry, DOD, NSF, NASA, NOAA, science agencies



# National: Transportation Systems

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- Priority #1: Uncertainties about science weather effects
- Priority #2: Integrating environmental and transportation plans
- Priority #3: Institutional barriers / decision-making
- Priority #4: How to do risk assessment
- Who:
  - USGCRP (with broad input), DOT, NOAA, EPA, Interior, TRB, AMPO, AASHTO, research institutions

# Key Results

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- Research is needed to address gaps
- “Clearing house” needed – to get existing data and research results to decision-makers
- Regional variation is key in setting priorities
- Opportunity for collaboration and to leverage existing research activities
- Coordinate program with CCRI / CCSPO
- Complete and disseminate workshop report, and select DOT Center research priorities